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ON THE PERFORMANCE OF MONO AND POLY EMBRYONIC ROOT-STOCKS IN MANGO GRAFTS

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Mango is an open pollinated plant propagated through sseds giving rise to numerous varieties, Most of the commercial varieties are mono-embryonic, though a number of polyembryonic ones exist especially in Kerala. To maintain the purity vegetative propagation methods are resorted to, of which inarching (grafting) is the most common. Seedlings of both mono and polyembryonic varieties are used as root-stocks for inarching. The fact that the character of rootstocks influences the growth and performance of scion has been well established in fruit crops like citrus and apple. Effect of the nature of the rootstock on scion in mango is not known fully. The few works existing in this field are those of Sen (1939) Gunaratnam (1946) Meluan (1954) and Oppenheimer (1968).

The present studies were taken up in order to ascertain the relative effects of mono and polyembryonic rootstocks on the growth and yield of mango grafts.

Material and Methods

Inarches were made using the scion materials from *Bennet Alphonso* and *Baneshan* and the rootstocks of *Chandrakaran*, *Bappakkai* and *Puliyan*. Of these rootstocks *Chandrakaran* and *Bappakkai* are polyembryonic and *Puliyan* monoembrysonic. The scion materials were taken from the same parent tree and rootstocks of the same age group were used for grafting. A field experiment was laid out at the Agricultural Research Station, Taliparamba, Cannanoore District, Kerala State, using grafts of the above six combinations, each replicated eight times; there were two plants in each replication. The grafts were planted in pits measuring 3x3x3 feet at a spacing of 30×30 feet during the year 1957. Uniform cultural and manurial treatments were given to all the plants.

Performance of the grafts under the different combinations were studied by taking measurements of height and girth of stock and scion of all the plants once in an year for six years. Girth measurements were recorded at the same spot every year.

Results

Figures 1 and 2 depict the relative growth in scion girth and stock girth of the different grafts for six years, using the regression equation. It may be clearly seen that inarches on polyembryonic rootstocks grew much quicker than on monoembryonic ones. Table 1 gives the data on annual increase in height of the different grafts.

Table 1

Average annual increase in height of different mango grafts.

Treatment No.	Graft combination	Increase in height in cm.					
		1958-59	'59–60	'60–61	'61–62	'62–63	average
T_1	*Bennet Alphonso/ Chandrakaran*	20.8	43.0	...	1.0	79.2	29.8
T_2	*BaneshanlChandrakaran*	17.9	26.1	9.6	2.2	60.1	23.2
T_3	*Bennet Alphonso/ Bappakkai*	24.8	35.6	2.9	1.2	77.8	28.5
T_4	*Baneshan/Bappakkai*	24.0	15.8	2.6	3.4	69.6	23.3
T_5	*Bennet Alphonso/Puliyan*	16.4	21.7	5.9	0.7	48.4	18.6
T_6	*Baneshan/Puliyan*	34.0	28.4	2.1	0.4	37.0	20.4

The annual growth increments in height recorded for the years 1960-61 and 1961-62 were low as the plants had to be severely prunned in these years due to dieback disease. But in general it is clearly revealed that inarches on polyembryonic rootstocks had a better vegetative growth than those on monoembryonic rootstocks.

Table 2 shows the average number of fruits per tree in the different combinations during the year 1963.

Table 2

Mean yield of fruits per tree for the year 1963.

Treatment No.	Graft combination	Average No. of fruits per tree
T_1	*Bennet Alphonso IChandrakaran*	110
T_2	*BaneshanlChandrakaran*	21
T_3	*Bennet Alphonso/Bappakkai*	66
T_4	*Baneshan/ Bappakkai*	19
T_5	*Bennet Alphonso/Puliyan*	14
T_6	*Baneshan/Puliyan*	12

It is evident that inarches on polyembryonic rootstocks were better yielders irrespective of the scion material. These observations agree with the view expressed by Roy *et al* (1951) that in mango, fruiting is directly proportional to vegetative growth.

Summary

In a field experiment conducted at the Agricultural Research Station, Taliparamba, Kerala, India, for a period of six years, it was observed that grafts (inarches) of *Bennet Alphonso* and *Baneshan* on the polyembryonic rootstocks of

Chandrakaran and *Bappakkai* were superior to those on the monoembryonic rootstock of *Puliyan* both in vegetative growth (height and girth) and in yield.

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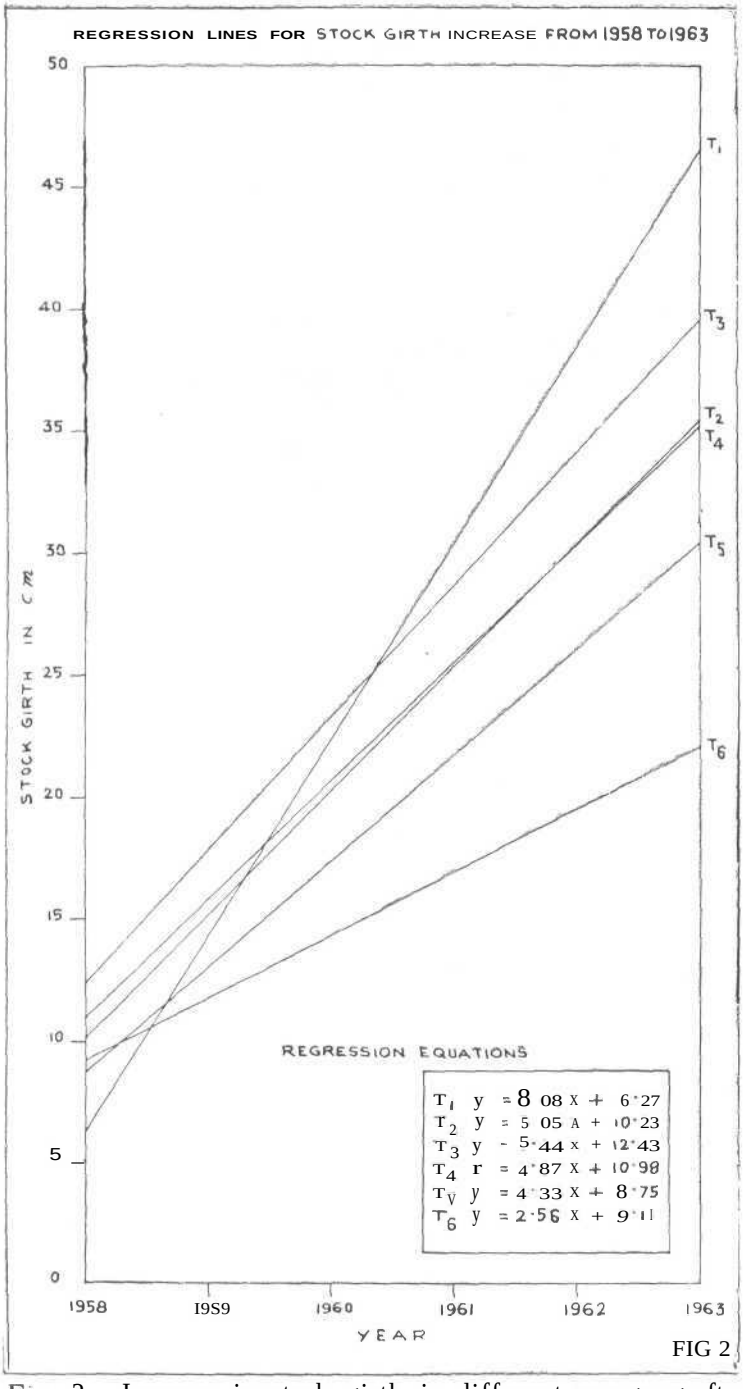

Fig. 2, Increase in stock girth in different mango grafts in different years.

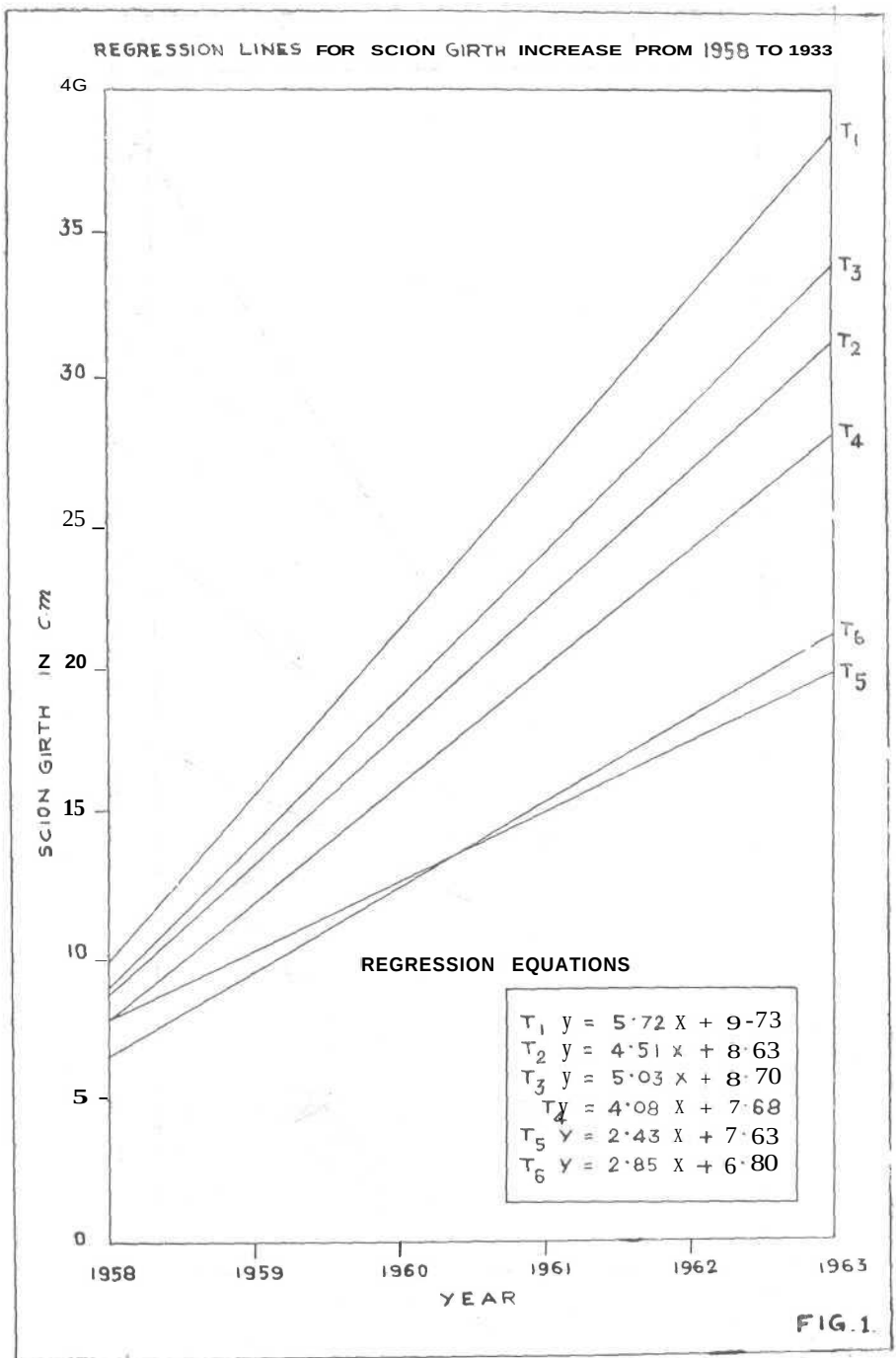

Fig. 1. Increase in scion girth of different mango grafts in different years.